# 818 BITUMINOUS CONCRETE MIXTURES

## 818.01 GENERAL

The Contractor shall submit to the Engineer for approval a job mix formula for each type of bituminous mixture proposed for use. Approval of a job mix formula for a specific project, purpose, or use does not approve its use for any other project, purpose, or use.

In the event two job mix formulas have been submitted and rejected for a particular project and mix type, $ 500.00 for each subsequent job mix formula checked shall be deducted from the Contract amount.

Production of bituminous mixtures shall not commence until an approved job mix formula has been obtained in accordance with these specification requirements. Any deviation from the approved job mix formula or approved source of materials shall require the approval by the Engineer.

The Contractor shall allow 20 working days to receive approval or rejection of a proposed job mix formula after it has been submitted to the Engineer for approval.

It is the Contractor's responsibility to furnish the Engineer the necessary quantity of materials for each proposed job mix formula to yield 75 pounds of bituminous mixture, with each job mix formula submitted. Each job mix formula submitted for approval shall include the following information:

**1.** Name of project and location.

**2.** Name of Contractor.

**3.** Name of producer or supplier.

**4.** Name and class or type of bituminous mixture.

**5.** Proposed use of bituminous mixture.

**6.** Name, source, and amount (percent by weight of total mixture) of all ingredient materials proposed for use, including:

**a.** Bitumen

**b.** Coarse aggregate

**c.** Fine aggregate

**d.** Mineral filler

**e.** Hydrated Lime or Liquid Anti Strip Additive

**f.** Other

**7.** Gradation of combined aggregate and mineral filler, expressed by percent passing required sieve sizes.

**8.** Mixing temperature.

**9.** Temperature of mix when delivered to the spreader and finisher.

**10.** Gradation test results for each aggregate size and source proposed.

**11.** Gradation test results of composite mixture.

**12.** The following tests performed on the total mixture prepared in conformance with AASHTO T 245.

**a.** Stability, AASHTO T 245

**b.** Flow

**c.** Bulk specific gravity

**d.** Maximum theoretical specific gravity

**e.** VMA

**f.** Percent air voids

**g.** Filler to asphalt ratio

**h.** Coating loss from boiling test

**i.** Strength before immersion

**j.** Strength after immersion

**k.** Number of blows used to mold Marshall Briquettes

A maximum of one primary and one alternate job mix formula per mix type will be approved per contractor and/or supplier per calendar year. An alternate job mix formula is either an alternate supplier or a single supplier with different combinations of materials.

## 818.02 DESIGN CRITERIA

Job mix formulas for bituminous mixtures submitted for approval as required in 818.01 shall be based on the criteria summarized in Table 818.02 and the following:

**(A)** The number of compaction blows used to mold Marshall Test specimens required in AASHTO T 245 (Table 818.02) will be 75/75 for bituminous mixtures used for Interstate construction, 50/50 for all other bituminous mixtures, unless specified otherwise in the Contract Special Provisions.

**(B)** For open graded asphalt friction course mixtures, the requirements of 818.01(6)(f), and 818.01(8) and (9) do not apply. The Engineer will specify the bitumen content, mixing temperature and compaction temperature requirements with the approved job mix formula. For estimation purposes, open graded asphalt friction course Type I is 5 to 8-1/2 per cent binder and Type II is 4-1/2 to 8 percent binder.

**(C)** For Stone Filled Sheet Asphalt Surface, the fine aggregate shall meet the requirements of 803.03 (E). Anti-strip additive or hydrated line shall be added as needed to meet the requirements stated in 803.03(E).

**(D)** The requirement for a minimum of forty (40) percent of the fine aggregate to be stone screenings, grading No. 10 is applicable to all bituminous mixes. The maximum amount of material passing the No. 200 sieve in the screenings however can not exceed fifteen percent and when used in surface mixtures they shall be from an approved source to attain skid resistance. Suitable manufactured stone sand can be used in lieu of No. 10 stone.

**(E)** The potential moisture damage on all paving mixtures shall be evaluated in accordance with ASTM D 4867 without the freezing cycle. The minimum retained strength shall not be less than 75 percent of the unconditioned pair of test samples. When the minimum retained strength can not be obtained with anti-strip additive, hydrated lime in slurry form shall be used in place of or in addition to the anti-strip additive.

**(F)** Proposed bituminous job mix formulas shall be adjusted by the addition or change of an anti-strip additive or hydrated lime. The amount of anti-strip additive or hydrated lime will be determined by the Engineer.

**(G)** The minimum percent coated particles after boiling (D.C. Test Method B 102) shall be 95 for all mixes.